PRELIMINARY REPORT ON THE INVESTIGATION OF THE DESERT GOLD ARCHAEOLOGICAL SITES

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INTRODUCTION

In an 11 week period between April 17 and July 4, 1978, the Office of Cultural Resource Management, Department of Anthropology, Arizona State University investigated 2 sites, AZ T:2:1 (ASU) and AZ T:2:2 (ASU), in partial fulfillment of a contract with the Bureau of Land Management for the Desert Gold Land Exchange archaeological project. Eighteen days were spent in the field by crews ranging in number from 1 to 10. The following documents field work performed at these sites. Glen Rice, Head, Office of Cultural Resource Management, served as Principal Investigator; Ed Dobbins was Project Director; and Jerry Howard was Assistant Field Supervisor.

The sites were first recorded in November, 1977 during a survey conducted by John Douglas, Chris Kincaid, and Pat Giorgi of the B.L.M. staff. AZ T:2:2 (ASU), also known as AR-02-020-1161 under the B.L.M. numbering system, is situated at an elevation of 2680 ft on the crest of a ridge between branches of Trilby Wash. The second site is AZ T:2:1 (ASU), or AR-02-020-1162 (BLM). It is situated at an elevation of 2400 ft on the crest and eastern slope of a ridge bordering one of the major branches of Iona Wash. The legal descriptions for both these sites are as follows:

AZ T:2:1 (ASU)	SE ¼ of SE ¼, Sec. 28, T7N, R3W
AZ T:2:2 (ASU)	Center of the W ½ of the W ½ of Sec. 25, T7N, R3W

Both sites are located on a large bajada slope extending down the southwestern side of the Hieroglyphic Mountains in the western desert of Arizona. The bajada is heavily dissected by washes and arroyos flowing towards the south. The vegetation of the area consists of scattered palo verde, creosote, saguaro, bursage, jojoba, and cholla. Table 1 contains a list of plants found at AZ T:2:1 (ASU). The density of plants increases in wash areas where there are also greater amounts

Table 1. Plants identified at Site AZ T:2:1 (ASU)

Larrea tridentada	creosote
Eriogonum tasciculatum	buckwheat
Kramerio parvifolia	rattany
Psilostrophe cooperi	
Thamnosma montana	turpentine-broom
Ambrosia deltoxidia	bursage
Fouguieria splendens	ocotillo
Cercidium microphyllum	paloverde
Cereus giganteus	saguaro
Opuntia bigelovii	jumping cholla
Erodium cicutarium	heron's bill
Amsinckia intermedia	(borage)
Canotia holacantha	crucifixion thorn
Opuntia acanthocarpa	staghorn cholla
Cereus greggii	night blooming cereus
Plantago spp.	Indian wheat
Ferocactus acanthodes	barrel cactus
Simmondsia chinensis	jojoba
Ephedra spp.	Mormon tea
Dichelostemma pulchellum	bluedicks
Acacia greggii	acacia
Lycium spp.	wolf berry
Cirsium spp.	thistle
Spaeralcea spp.	globe mallow
Eriogonum spp.	buckwheat
Haplopappus spinulosus	
Eriastrum eremicum	
Opuntia phaeacantha	prickly pear
Lesguerella gordoni	

of palo verde and mesquite. The sites border the 2 major washes flowing through the area.

AZ T:2:1 consists of a large scatter of artifacts extending 230 m along the east facing slope of the ridge and averaging 70 m in width. A core area of the site containing a higher density of artifacts measures 70 m north to south and 30 m east to west. The soil in the core area is a greyish black color and appears to have a high organic content.

The artifactual content of this site consists solely of lithics and includes a high number of bifacially worked tools such as knives, projectile points and scrapers. Grinding implements also occur and tend to be restricted to the core area. Preliminary sorting after completion of the field work tends to indicate a high ratio of core to flake tools.

AZ T:2:2 measures 200 m north to south and 50 m east to west with a core area measuring 35 by 25 m. This site consists of both lithic and ceramic artifacts with the ceramic artifacts tending to be clustered in the core area. A greyish black midden also characterizes the core area.

Both of these sites are relatively comparable in size and structure. Each appears to consist of a core area in which higher artifact and midden accumulation occurs surrounded by more limited and possibly specialized activity areas on the periphery. The major difference between the sites is the occurrence of pottery at AZ T:2:2. A viable hypothesis would be that the sites represent seasonally reoccupied camps at which food gathering and processing occurred (Douglas 1977).

This report is organized into 2 parts. The first is a description of the research problems which are to be addressed by the study and which have guided the design of the field work. The second part of the report describes the implementation and preliminary results of the field work.

RESEARCH PROBLEMS

The Desert Gold archaeological sites present an opportunity to gain an improved understanding of the culture history and adaptive strategies of the prehistoric populations occupying the western central desert of Arizona. The sites occupy nearly identical environmental settings. Both are on a bajada slope next to major washes with direct access to riparian as well as palo verde/saguaro plant associations. Both sites also have similar densities of artifacts and appear to be the remains of seasonally occupied habitation units. However, despite these similarities, there is an important material culture difference between the 2 sites. AZ T:2:2 (AR-03-020-1161 BLM) contains ceramic artifacts while

AZ T:2:1 (AR-02-020-1162 BLM) does not. This suggests that there is a temporal, functional and/or ethnic difference between the occupations of the 2 sites. The research objective in the planned study is to test these alternate possibilities and to develop a statement about the different uses during prehistoric times of this particular type of bajada setting. Since the environment is a constant variable, it is logical to concentrate on an examination of cultural and/or developmental factors to account for the major differences in material culture. Several possibilities are expressed in the form of hypotheses:

Hypothesis 1: The 2 sites are functionally similar, but temporally distinct, The presence of ceramics at one represents a technological/stylistic shift through time.

Hypothesis 2: The 2 sites are contemporaneous, but functionally distinct. The presence of ceramics represents 1 aspect of the functional difference.

Hypothesis 3: The 2 sites are contemporaneous and functionally similar. The presence of ceramics at one represents an ethnic difference.

Hypothesis 4: The 2 sites are temporally and functionally distinct. The presence of ceramics represents a technological/ stylistic shift as well as a change in settlement/ subsistence systems.

Structuring the study around a test of these 4 hypotheses helps to draw together the consideration of a diverse variety of archaeological topics. A consideration of culture history is needed to determine the significance of both the temporal and spatial relationships of artifact styles. Functional analysis of artifacts, based on wear pattern studies, will be used to measure the degree of functional similarity between the 2 sites. The same data will be used in a computer program to define activity areas at each site; and the spatial organization of activity areas across the site will be used to arrive at a description of community pattern. This will enable a comparison of the 2 sites on the basis of social organization as well as artifact function. Pollen and soil analyses will be used to examine and compare the types of resources exploited in the subsistence system. Source analyses of the materials used to manufacture chipped stone and ceramic artifacts will enable an analysis of the directedness of spatial contacts between prehistoric populations.

Each of these topics is examined below with a consideration first of the field and analytical methods needed to obtain the data followed by a consideration of how the data are to be used in a test of one or more of the hypotheses.

Culture Historical Analysis

Culture history is taken here to refer to concern with the spatial and temporal distributions of archaeological units defined on the basis of artifact styles. Units which have long temporal duration with relatively restricted spatial distributions are called traditions; units with wide spatial distrubutions and short temporal duration are called horizons; and units with relatively short temporal and spatial distribution are termed phases (Willey and Phillips 1953). These units can be defined on the basis of a single stylistic type or a combination of different types. In the latter case the types are frequently drawn from different fields of artifacts, such that a unit might be defined as the combination of ceramic, projectile point, and architectural styles. The purpose of culture history is to define a space-time framework against which other kinds of cultural variation can be measured.

The culture history of west central Arizona has been defined in general terms by such archaeologists as Colton (1939), Rodgers (1939), Schroeder (1954) and Dobyns and Euler (1960). There is some evidence for an early Paleo-Indian Tradition at Ventana Cave (Haury 1950), although the importance of big game hunting in the western desert is not at all clear. The succeeding Archaic Tradition is better documented (Barrera 1970; Ezell 1954; Rodgers 1959) and is characterized by a seasonal round, hunting and gathering system. By definition the Archaic Tradition ends with the introduction of pottery, although there may have been little change in the settlement-subsistence system. Many ceramic sites in the desert may also represent temporary camps left by trading or resource collection parties from such regions as the Hohokam to the east, the Lower Gila to the south, the Colorado River to the west, or the Prescott area to the north (Brown 1977).

A major time-related research question deals with the relative antiquity of ceramic and non-ceramic deposits. The question of whether it is possible when dealing with habitation units (rather than limited activity areas) to assign deposits lacking ceramics to an Archaic Tradition or whether there were both ceramic and non-ceramic occupations during the post-Archaic period can be addressed using both absolute and relative forms of dating. A set of absolute dates (radiocarbon, archaeomagnetic) from a series of both kinds of deposits would be the most direct way of resolving the question. During the excavation of the Desert Gold sites particular attention was paid to the recovery of datable materials (charcoal) or features (fire hearths).

In the absence of such finds, it might be possible to obtain a radiocarbon date on the organic fraction of the midden matrix itself

(Irv Taylor, personal communication). The problem then becomes one of demonstrating that the organic fraction of the midden is to a large extent a product of cultural activity. To control for this, soil samples were taken from both off-site and in-site contexts. If the off-site soils show a low organic content (which is what we would expect in a desert situation), then it can be assumed that the organic content of the midden matrix is largely induced by cultural activity and that a radiocarbon date of the matrix will provide an average date for the occupation of the site. Soil samples from the Desert Gold sites will be submitted for dating if tests for the organic content of both the midden and off-site central locations produce the appropriate results.

Relative dating methods can also be used to determine whether or not the 2 Desert Gold sites were contemporaneous. Both sites have produced an appreciable number of bifacially worked lithic artifacts. Because of the degree of manufacturing effort involved in the production of such objects, they tend to have been susceptible to stylistic changes over time. The styles of bifaces from both sites will be compared to determine if significantly different sets of styles are represented. The comparison will also be extended to include other sites reported in the literature. If the styles are found to vary significantly between the 2 sites, then the hypothesis that they are not contemporaneous is supported. Of course, this inference is useful only in conjunction with other, parallel types of supporting evidence since such variation in styles may also reflect synchronic ethnic differences. The determination of the absolute and relative dates of these 2 sites is needed for an evaluation of all 4 hypotheses.

A comparison of styles of ceramics and projectile points found at the Desert Gold sites with those from other sites in the region can also establish regional connections. For example, does the ceramic site represent an incursion by a group from the Hohokam area to the east and south, or from the Prescott area to the north? Does the site represent a local group which has obtained pottery through trade with a variety of areas including the Hohokam and Sinagua? Did the occupants make their own pottery from local sources and copy styles in other areas? Answers to these types of questions have significant import to a reconstruction of subsistence patterns, population movements and interaction, and trade relationships. Data on styles of projectile points and pottery from other sites will be obtained from available reports in the literature and from cultural resource management documents for the region.

The determination of spatial relationships as represented in artifact styles is important for evaluating ethnic relationships (Hypothesis 3) and for assessing land use patterns by different groups (Hypothesis 4).

Functional Analysis

The purpose of functional analysis is to define units which reflect differences in prehistoric use patterns. At the artifactual level the most direct evidence for use is the patterns of breakage and dulling which result from the friction generated as a tool is used on the substance being processed.

The utility of wear pattern analysis in prehistoric lithic artifacts was first demonstrated by Semenov (1964). The systematic identification of wear patterns on restricted fields of artifacts has been pursued by many archaeologists (e.g., Frison 1968; Nance 1971; Hester and Heizer 1972, 1973). White (1967) was one of the first, however, to systematically incorporate wear patterns into a functional classification designed to encompass an entire collection of artifacts. Dunnell (1974) discusses the theoretical basis for using wear patterns in a classification of artifacts and defines tool types in a manner which incorporates instances of multiple use of the same object. The method outlined by Dunnell will be used in the analysis of the Desert Gold artifacts.

The results of a functional classification, when quantified, can be used in a variety of ways. On an inter-site level it is possible to correlate site function with microenvironmental patterns. If 2 (or more) sites are part of the same subsistence system and if they are in similar microenvironments, then we can expect that the same range of activities will have been performed at each site and that this will be reflected in the archaeological record by a similar range and frequency of functional types. Thus, we would predict functional similarity for the Desert Gold sites (since they occur in similar microenvironments) if they are part of similar subsistence systems (Hypotheses 1 and 3).

If it is found instead that the variety and frequency of functional types differ significantly between the 2 sites, then they must be considered functionally distinct and it is much less likely that they represent components of a single subsistence system. If the sites are also temporally distinct, then this would indicate a change through time in subsistence systems (Hypothesis 4). If they are contemporaneous, it would indicate that the same environmental setting was being exploited prehistorically by 2 different social systems (a variation of Hypothesis 3).

The results of the functional analysis can also be used at an intra-site level to examine community patterns and social organization. The methods and implications of this approach are discussed under a separate heading below.

Community Pattern Analysis

Community pattern refers to the layout and organization of a single community. The archaeological reconstruction of the community pattern at a single site can vary, depending on the variables which are selected for the analysis. Longacre (1968), for instance, used styles of ceramic artifacts in an attempt to arrive at a community pattern analysis which emphasized the organization of kinship units within a site. In contrast, Hill (1968) used functional characteristics of rooms, features, and artifacts to arrive at a reconstruction of the organization of activities at his site. These various approaches serve different purposes, and it is important to recognize that the resulting reconstructions can be quite varied.

A community pattern analysis of the Desert Gold sites will be attempted based on the functional classification of lithic artifacts. The approach has been used previously by Rice on a lithic site in California (Rice and Cottrell 1976:40-47). The portion of each site area which has been surface collected will be divided into a set of grid units and the units will be clustered (using a statistical computer program) on the basis of the types and frequencies of tool types present. The surface data will be used since there is good surface coverage of each site (as opposed to excavated units which are relatively restricted). The clusters will then be mapped onto the sites to define activity loci. The result is a community pattern analysis which depicts the organization of activities using lithic tools.

A comparison of the results from the 2 sites may provide clues about changes in social organization. For instance, the computer program will probably identify a type of activity which can be classed under the general label of "grinding." As a hypothetical example, we might find that at 1 site grinding activities occur at multiple locations while at the other they occur in a single location. This would constitute a change in the social organization of the groups occupying each site; and even though it may never be possible to determine the exact nature of the change (e.g., band vs. lineage organization), we could at least note that some kind of change had occurred. Such differences in social organization could reflect differences in ethnicity or in settlement-subsistence systems and would be useful in a test of Hypotheses 3 and/or 4.

Ecological Analyses

Several different forms of analysis will be used to study the relationship of the prehistoric occupants of the Desert Gold sites and their natural environment.

Pollen analysis will be used to examine the variety of plant resources which were being introduced into the site area for economic reasons. Studies of stratified samples will also be used to determine if there were any major changes in the environment through time.

Soil samples were also taken during the field work for flotation analysis. It may be possible to recover burned seeds, nuts, pieces of plants, or burned bone which would provide another indication of the resources used prehistorically. However, during excavation it was noted that the soil contained very few specks of charcoal, and it is unlikely that the flotation will be very productive.

Comparative soil analyses will also be conducted on samples taken from both on- and off-site locations. We intend to measure both the organic and the nitrogen content of the samples, since both indices should be unusually high at on-site locations if cultural activities resulted in the accumulation of large amounts of vegetable and animal remains. The need to compare the organic content of the soil for dating purposes has been discussed above under the heading of culture history.

Source Analyses

One important way archaeologists have to measure the intensity, nature, and direction of social interaction on a regional basis is to determine the geographical source of rare and/or exotic artifactual materials. Pottery types can sometimes be traced to their location of manufacture if they are of a distinctive style, or are manufactured from a distinctive past, or contain temper inclusions specific to a particular geological setting. Lithic materials such as obsidian may sometimes have very distinctive coloring or texture characteristics which can be traced to a particular location. Quantifying such occurrences can provide a measure of the direction and intensity of the regional exchange of resources (e.g., Ericson 1977; Plog 1977).

A source analysis in a region as poorly understood as the Arizona western desert would require far greater resources than are available for this project, although some success might be possible using comparative data from the literature. A less ambitious reconstruction, but one more likely to succeed, would be a simple comparison of the quantity of exotic materials at the 2 sites. If there is a major difference, then some kind of change in regional interaction can be posited. This type of information is useful in distinguishing between different interaction networks and might be useful in the test of Hypotheses 3 and 4.

Summary

These research problems serve to delineate the types of data which are to be recovered during the field work and the subsequent analysis. The objective of the research is to examine the relationships between artifact style and function against a space-time framework in order to make statements about the operation of prehistoric social systems. If the analysis is successful, it should be possible to reconstruct chronological and spatial relationships between the sites and compare them on the basis of artifact function, social organization, subsistence procurement systems, and regional interaction networks.

FIELD METHODS

Archaeological activities performed at the 2 Desert Gold sites include surveying with a transit for the preparation of contour maps, collecting of surface artifacts, and subsurface testing. The following sections give general outlines for each procedure and detail specific activities performed at each site. All artifact counts are preliminary field tallies, and no attempt has been made at this time to interpret collected data. Table 2 summarizes time and money expenditures for the field work phase of this project.

Mapping Procedures

At both sites horizontal and vertical controls were established with a Wild T16 Direct Reading Theodolite and metric stadia rod. A Brunton pocket transit and a 50 m fiberglass tape were used for secondary measurements. Generally, the theodolite was used for measuring excavation unit depths and taking contour map readings, and the Brunton compass was used for the placement of excavation units. All horizontal controls were oriented to true north.

AZ T:2:2 (ASU)

A baseline was established along the long axis of this site at an orientation of 262°00'. The datum was placed near the site's core area as determined by preliminary inspection of artifact density. Survey stakes were marked with appropriate coordinates, flagged, and placed along the entire baseline at 20 m intervals. These stakes were subsequently utilized for locating collection units and test pits and as

Table 2. Management Summary

MAPPING PROCEDURES			SURFACE COLLECTIONS			EXCAVATIONS				OTHER*			
Instrument Surveying	Proton Magnometer Readings	Estimated Cost	Area Collected	Person Days	Estimated Cost	No. Units Excavated	m^3 Excavated	Person Days Expended	Estimated Cost	Person Days	Estimated Cost	TOTAL PERSON DAYS	TOTAL ESTIMATED COST
15 PD	2 PD	$10 m^2	9764 PD	31.5	$1890	38 units	10.04 m^3	51 PD	$3060	14.5 PD	$870	114 PD	$6840

* This category includes equipment preparation, photography, backfilling and preparation of field maps.

Costs are based on an average of all salaries as well as travel, subsistence, lodging, and University related overhead. The figure for this project was $60.00 per person per day spent in the field. No laboratory costs are included.

instrument stations for contour mapping purposes.

It had been originally anticipated that contour map readings could be made coterminus with artifact point proveniences. Vegetation and a somewhat higher artifact density than initially expected prevented implementation of this method. Instead, contour readings were taken along vectors perpendicular to the long axis of the ridge. These vectors were spaced at 20 - 30 m intervals with contour readings being recorded every 10 - 15 m or when a break in the vegetation afforded a clear view. The entire site and an additional margin of approximately 50 m was surveyed in this manner. The site baseline was also tied into the quarter section bench mark between Sections 25 and 26, Township 7N, Range 3W.

Approximately 9 person days were required for the completion of the above field work.

AZ T:2:1 (ASU)

A single central datum was utilized at this site for horizontal and vertical controls. This datum was placed in the core area of the site as defined by preliminary inspection of artifact density. Additional stakes marking test unit corners were located from this point when necessary.

Fine instrument stations were employed at this site for contour mapping purposes. All stations were located relative to the original site datum while in the field. Vectors at 20^{0} - 30^{0} intervals were walked, and readings extend 50 m beyond site boundaries. Vegetation and irregular topography sometimes necessitated alterations in this procedures. In general, as areas of greater relief were encountered across the site, intervals between contour shots were lessened. The central datum was tied into a bench mark at the corner of Sections 27, 28, 33, and 34, Township 7N, Range 3W.

Six person days were required for completion of the above field work.

Surface Collection

The surface collection involved the use of a Brunton pocket transit with tripod, several 50 m fiberglass tapes, a collection crew and a recording cres. All surface materials were collected in units of 1 m^2 in size. The coordinates of the northeast corner grid were used for provenience. Groundstone, chipped stone, and ceramics were bagged

separately, and each bag was assigned a field specimen number.

Collection units were established by extending a 50 m tape along an appropriate azimuth (usually a cardinal direction) with the aid of a Brunton compass. Additional tapes were laid perpendicular to this at intervals corresponding to half the number of people on the collection crew. Each crew member walked a 1 m wide collection swath the length of the transect tape and back. Artifact type, number and unit provenience were recorded on collection bags which were then placed in the center of the appropriate unit. A recording crew, 1 recorder and 4 collectors, followed the collection crew checking proveniences and assigning specimen numbers. This information was also recorded on ASU Specimen Number Forms.

AZ T:2:2 (ASU)

A 2 stage systematic sampling design was utilized for the surface collection of this site. The first stage consisted of 4 m wide collection transects located every 10 m perpendicular to the site baseline. These were alternately placed on either side of the baseline and extended to the site boundaries. Transect locations and corresponding artifact counts were then plotted on graph paper. This representation of surface artifact density enabled a better definition of both the core area and site boundaries. Utilizing this information, the second stage of collection emphasized a more intensive coverage of the core area and extended the collection scheme beyond what had been previously designated as the eastern site boundary. Collection in the core area was doubled while the new site areas were covered at the same intensity as the remainder of the periphery. Transects in this area were all directed south from the baseline due to the irregular orientation of this portion of the ridge.

A total of 3668 m^2 were surface collected at this site. This represents 35.7% of the total site area (10,280 m^2) with 59.1% (648 m^2) of the core area (1096 m^2), and 32.9% (3020 m^2) coverage of the periphery, yielding a total of 1104 artifacts. A total of 718 of these were found in the core area. Table 3 presents a further breakdown of the field counts.

AZ T:2:1 (ASU)

A 100% surface collection was planned for this site. This did not prove to be a feasible approach due to the very high artifact density.

Table 3. Surface Collections AZ T:2:2 (ASU)

Total Site Area = 10,280 m^2
Core Area = 1,096 m^2
Periphery Area = 9,184 m^2

Collections	Area (m^2)	%	Specimens	Artifacts	Chipped Stone	Groundstone	Ceramics	Artifact Density per m^2
Total Site	3,668	35.7	519	1104	334	25	745	.30
Core	648	59.1	268	718	137	14	567	1.1
Periphery	3,020	32.9	251	386	197	11	178	.13

When this was realized, a systematic collection strategy was implemented. A 100% surface collection of the core area was made; and transects 6 - 8 m wide were placed every 15 - 20 m across the periphery area. The result was a series of collection swaths located a maximum of 12 m apart across the entire site.

A total of 6096 m^2 (42.3%) of the 14,400 m^2 site area was collected in this manner. This includes 1144 m^2 (100%) in the core area and 4952 m^2 (37.4%) in the periphery. The 1136 specimen numbers contained 2243 chipped and groundstone artifacts. A total of 1126 of these were found in the core area. Table 4 lists further breakdowns of the surface collection yield at this site.

A total of 22.5 person days were required for the above field work.

Excavation Procedures

Testing for subsurface cultural materials was performed at both sites. All excavations were carried out in 1 x 1 m test units dug in arbitrary 10 cm levels. Work was accomplished using trowels and shovels. All dirt was screened through 1/4" or 1/8" mesh. Soil samples for flotation and pollen analysis purposes were collected from each level.

Excavation units were located with compass and tape. Each square was set up by either compass or triangulation from 2 existing corners. While this is considered to be an efficient method for establishing individual units, some error is to be expected when a number of units are located in this manner over a discontinuous period. Fig. 1 diagrams the discrepencies between our ideal grid system and the actual placement pit locations at AZ T:2:1 (ASU).

All units at both sites were located in the core areas. This reflects both research priorities and limitations on time and resources. Test units were selected in the core areas using a combination of judgemental systematic and random sampling designs. Judgemental placements of units were made initially at both sites as the preliminary step towards enacting a more formal sampling design. Four variables were considered in the selection processes: 1) soil color and texture, 2) slope gradients, 3) artifact density, and 4) surface disturbance. Each location purposefully chosen represented a different combination of attributes of these variables.

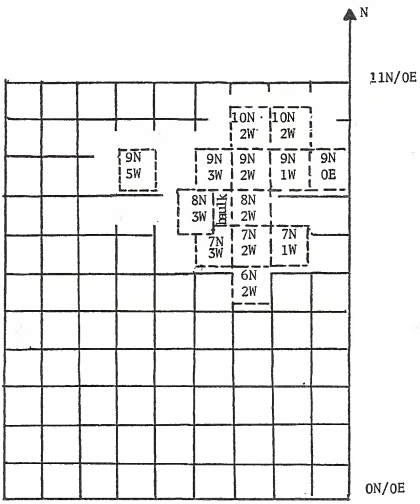
Based on the results of the initial test units, field decisions were made to either continue testing judgementally, systematically or randomly. Systematic or stratified random strategies were utilized in an effort to

Table 4. Surface Collections AZ T:2:1 (ASU)

Total Site Area = 14,400 m^2
Core Area = 1,444 m^2
Periphery Area = 13,256 m^2

Collections	Area (m^2)	%	Specimens	Artifacts	Chipped Stone	Groundstone	Shell	Artifact Density per m^2
Total Site	6,096	42.3	1,136	2,243	2,209	33	1	.37
Core	1,144	100.0	507	1,126	1,101	24	1	.98
Periphery	4,952	37.4	629	1,117	1,108	9	0	.23

Fig. 1. Irregular Test Pit Locations at AZ T:2:1 (ASU) *



_____ = ideal grid system

----- = actual test pit locations

* 12 units are located 20 cm north of ideal grid locations
* margin north and east of 8N/3W was excavated as 40 cm baulk unit
* all other units conform to ideal grid system

attain adequate horizontal dispersion of units. It was felt this aspect of both systematic and stratified samples outweighed other disadvantages inherent in the approaches.

AZ T:2:2 (ASU)

A total of 10 test pits were dug at this site. The first 3 units were placed judgementally and the remaining 7 systematically.

Test Unit 1 (7S/4W) was located on a slope with an undisturbed gravelly light brown silt surface cover. No artifacts had been located on the surface and the unit reached sterile bedrock before 10 cm. Test Unit 2 (OS/23W) was located on a moderate slope with a darker brown silt cover containing 6 surface artifacts. Decomposing bedrock was reached at 35 cm. Test Unit 3 (10S/11W), was located on a moderate slope with gray soil and no surface artifacts and reached a depth of 36 cm before a hard caliche layer was encountered.

Using this information as a guideline, a systematic sample was enacted at this site. Two diagonal axes, northwest-southeast and northeast-southwest, and 1 north-south axis were imposed upon a map of the redefined core area. One 1 x 1 m unit was placed every 8 m along these axes and excavated. This figure was arrived at by estimating the amount of time available for work on this site and the amount of work which could reasonably be expected within this period. As some time remained after the completion of these units, new test pits were located at 4 m intervals along the north-south axis. Units which fell onto areas similar to Test Unit 1, steep slope with gravel surface cover, were discarded in this sample. Units entirely disturbed by vegetation were also moved to the nearest relatively clear area.

A total of 3.07 cubic meters of fill were excavated at this site. Eight of the 10 units were excavated to sterile which reached a maximum depth of 50 cm below surface. Sterile strata tended to be a hard naturally packed caliche near the center of the core area towards the top of the ridge and a decomposing granite layer towards the margins of the core area. Cultural fill was a loosely compacted ashy silt ranging in color from light to very dark gray. No natural strata were apparent. Artifactual materials, however, consistently reached their highest densities in the 10 - 20 cm level. Whether this is significant or simply fortuitous cannot be determined until all units have been plotted relative to the main site datum. One unidentified portion of a mammalian long bone was recovered in Level 2 at 14S/19W. The bone fragment is not burnt and appears to be naturally broken. Table 5 gives short descriptions of each test unit at the site.

Table 5. Excavation at AZ T:2:2 (ASU)

L = lithic G = groundstone
C = ceramic B = bone

Test Unit Number	Test Unit Location	Surface	0 - 10 cm	10 - 20 cm	20 - 30 cm	30 - 40 cm	40 - 50 cm	Final depth and Bottom	Selection Strategy
1	7S/4W	0	0	--	--	--	--	5 cm Granite	Judgemental
2	0S/23W	4C 2L	0 (partial level)	18C 9L	7C 2L	0	--	35 cm Granite	Judgemental
3	10S/11W	0	9C 9L	5C 1L	1C	0	--	36 cm Caliche	Judgemental
4	6N/28W	2C	1C	1L	--	--	--	~25cm Caliche	Systematic
5	7S/33W	0	1L	--	--	--	--	12 cm Granite	Systematic
6	3N/19W	0	0	2C	NA	1C 1L	0	50 cm Granite & Caliche	Systematic
7	9S/19W	2C	7C 9L	11C 9L	3C 4L	4C	1C	49 cm Caliche	Systematic
8	6N/19W	0	2C 1L	8C 4L	15C 3L	--	--	30 cm Unfinished	Systematic
9	14S/19W	1C 1L	1C 1L	6C 4L 2B	8C 8L 1G	3L	--	40 cm Unfinished	Systematic
10	2S/20W	1L	5L	0	--	--	--	25 cm Caliche	Systematic

AZ T:2:1 (ASU)

Twenth-eight 1 x 1 m test units were excavated at this site. Nineteen of these were located by purposive means and 9 resulted from a stratified simple random procedure.

Initially, 5 units were purposively selected according to the criteria given above. One of these units, 8N/3W, reached a depth of 76 cm below surface and contained indications of a subsurface pit feature. Eleven adjacent units were then excavated to a depth of 10 cm in the hopes of uncovering the outlines of a feature stain. Unfortunately, none were found. Later a contiguous unit to the east, 8N/2W, was excavated to sterile. The apparent feature could not be unambiguously defined in this unit.

Another area 8 m west of these units was also concentrated upon as a result of proton magnetometer readings. This instrument provides relative measures of subsurface magnetism. Anomalous increases in magnetism may result from cultural activities such as firing. An area approximately 6 x 3 m in size of anomalous readings was discovered during magnetometer mapping of the NW 1/4 of the core area. Four test pits were excavated and it was established that the anomaly resulted from natural geologic phenomena.

Finally, a stratified simple random design was implemented to insure adequate horizontal dispersion of test pits across the core area. The area was divided into sections 64 m^2 with 1 unit from each randomly selected for excavation. Sections already containing test units were not included. A total of 8 units were selected and excavated by this strategy. Summary descriptions of all features are listed in Table 6.

Approximately 6.97 cubic meters of fill were excavated at this site. Eighteen of the 28 units were excavated to sterile caliche on a decomposing granite stratum. The depth below surface ranged from 18 to 76 cm. The hard caliche stratum is naturally packed and undulating, making definition of features such as pits difficult. No features could be defined with certainty. As a precautionary measure, comparative soil samples were taken from pockets and undulations which appeared to be portions of possible features.

The fill at the site is an ashy silt ranging from light to very dark gray. The soil tends to become darker with increasing depth although no distinct strata were observed. However, in units excavated below 45 cm, floating boulders of soft caliche consistently occurred between 45 and 60 cm. This situation is enigmatic and may be the result of cultural activities.

Table 6. Excavation at AZ T:2:1 (ASU)

L = lithic G = groundstone
B = bone NA = not available
S = shell

Test Unit Location	Surface	0 - 10 cm	10 - 20 cm	20 - 30 cm	30 - 40 cm	40 - 50 cm	50 - 60 cm	60 - 70 cm	70 - 80 cm	Final depth & bottom	Selection Strategy
1N/12W	1L	33L	11L	--	--	--	--	--	--	25 cm Caliche	Systematic
14S/5W	0	NA	NA	0	--	--	--	--	--	30 cm Granite	Systematic
18S/8W	2L	23L	12L	--	--	--	--	--	--	20 cm Granite	Systematic
2N/1E	2L	46L	42L	2L	--	--	--	--	--	30 cm Caliche	Systematic
2S/3E	4L	1B NA L	NA	4L	--	--	--	--	--	30 cm Caliche	Systematic
9N/5W	0	40L	11L	8L	--	--	--	--	--	30 cm Caliche	Judgemental
4S/7W	1L	2L	NA	31L	1G 5L	10L	2L	--	--	65 cm Caliche	Systematic
10N/12W	2L	7L	0	--	--	--	--	--	--	20 cm Caliche	Judgemental (Anomaly Area)

Table 6 (cont'd)

Test Unit Location	Surface	0 - 10 cm	10 - 20 cm	20 - 30 cm	30 - 40 cm	40 - 50 cm	50 - 60 cm	60 - 70 cm	70 - 80 cm	Final depth & bottom	Selection Strategy
11N/11W	0	0	0	--	--	--	--	--	--	20 cm Caliche & Granite	Judgemental (Anomaly Area)
10N/10W	5L	18L	0	1L	--	--	--	--	--	25 cm Caliche	Judgemental (Anomaly Area)
9N/9W	0	15L	22L	0	--	--	--	--	--	25 cm Caliche	Judgemental (Anomaly Area)
1N/17W	4L	18L	0	--	--	--	--	--	--	18 cm Granite	Systematic
3S/7E	0	1G 13L	8L	--	--	--	--	--	--	20 cm Caliche	Judgemental
10N/1W	0	1G 27L	--	--	--	--	--	--	--	10 cm Unfinished	Judgemental
9N/0E	0	36L	--	--	--	--	--	--	--	10 cm Unfinished	Judgemental
6N/2W	0	1S 32 L	--	--	--	--	--	--	--	10 cm Unfinished	Judgemental
7N/3W	0	71L	--	--	--	--	--	--	--	10 cm Unfinished	Judgemental

Table 6 (cont'd)

Test Unit Location	Surface	0 - 10 cm	10 - 20 cm	20 - 30 cm	30 - 40 cm	40 - 50 cm	50 - 60 cm	60 - 70 cm	70 - 80 cm	Final depth & bottom	Selection Strategy
9N/1W	0	36L	--	--	--	--	--	--	--	10 cm Unfinished	Judgemental
7N/1W	0	19L	--	--	--	--	--	--	--	10 cm Unfinished	Judgemental
10N/2W	3L	41L	--	--	--	--	--	--	--	10 cm Unfinished	Judgemental
9N/2W	4L	47L	--	--	--	--	--	--	--	10 cm Unfinished	Judgemental
7N/2W	4L	16L	--	--	--	--	--	--	--	10 cm Unfinished	Judgemental
9N/3W	1L	41L	--	--	--	--	--	--	--	10 cm Unfinished	Judgemental
8N/2W	0	4L	18L	15L	12L	3L	10L	5L	--	30 cm Caliche	Judgemental
3S/5W	1L	11L	7L	25L	1B 29L	1B NA L	NA	2L	--	65 cm Caliche	Judgemental
10S/14W	1L	1B 17L	0	--	--	--	--	--	--	25 cm Granite	Systematic
7S/27W	1L	0	--	--	--	--	--	--	--	15 cm Granite	Judgemental

Table 6 (cont'd)

Test Unit Location	Surface	0 - 10 cm	10 - 20 cm	20 - 30 cm	30 - 40 cm	40 - 50 cm	50 - 60 cm	60 - 70 cm	70 - 80 cm	Final depth & bottom	Selection Strategy
8N/3W 40 cm Baulk	--	9L	8L	12L	1B 18L	1B 2L	2L	2L	9L	70 cm Caliche	Judgemental
8N/3W *	1L	43 L (0 - 45 cm)				20 L (45 - 76 cm)				76 cm Caliche	Judgemental

* not excavated in 10 cm levels

As was found at AZ T:2:2 (ASU), the deepest units at this site were located near the center of the core area. Units become increasingly more shallow outward from the core area and sterile strata grade from caliche to decomposing granite.

On July 4, 1978 test units at both sites were lined with plastic and backfilled. Two person days were required for this task.

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